disk between the two nodal lines, the vibration of a rod clamped at both ends will be represented; whilst the outer half of the latter length of slit will represent similarly a closed organ pipe giving its fundamental note. In this way by restricting the slit to various parts of the disk, various vibrating rods of metal and organ-pipes can be represented.

The disks thus produced I have had very satisfactorily lithographed for students' use.

Should any of your readers be desirous of obtaining further information I shall be happy to oblige them.

F. CHESHIRE.

P.S.—In the drawing of the disk given the centre has been filled up by broken circles. As thus drawn the inner circle may with advantage be blackened over.

THE SCIENCE MUSEUM AND GALLERY OF BRITISH ART AT SOUTH KENSINGTON.

MOST people were under the impression that they had heard the last of the absurd proposal that the site in South Kensington, which had already been set apart for scientific purposes, should be appropriated for the British Art Gallery. After all, however, the scheme has not, it seems, been definitely abandoned. Mr. Tate is said to have decided that if this particular piece of land is not granted he will withdraw the offer of his pictures and of the money he is willing to give for the erection of a suitable building. Men of science, like other people, would be sorry if the nation lost the advantages which Mr. Tate wishes to confer upon it; but they are bound to protest strenuously against the notion that it is either right or expedient to try to promote the interests of art at the expense of those of science. The South Kensington site is urgently wanted for the purposes for which it has been promised. Careful investigation has shown that every foot of the land will be needed for an adequate Science Museum and for laboratories; and if Mr. Tate's idea is acted upon, irreparable injury will be done, not only to the Royal College of Science, but to the entire system of scientific training in England. It has been asserted that the land "was bought for science and art," and that, consequently, science has "no monopoly in it." The land was not bought for "science and art." It was bought for "science and *the arts*," by which were meant the industrial arts, the development of which directly depends on science. The whole difficulty is due to the haphazard way in which all that relates to science is treated by public authorities in this country. If England had possessed a Minister of Education, with powers corresponding to those which belong to the French or the Prussian Minister of Education, he would never have permitted this question to be even opened; and Mr. Tate would probably have obtained long ago a proper site elsewhere. Of course nothing that can be done to prevent an act of utter folly and injustice will be left undone in Parliament by the scientific members.

The following letter on the subject appeared in the *Pall Mall Gazette* on Wednesday, February 10:—

SIR,—Before Parliament and the public agree to the somewhat exacting terms which Mr. Tate appears to make a condition of his munificent donation, I would beg your leave to submit the following questions for their consideration:—

1. Why should he not be satisfied with the plot of ground, somewhat higher up the Exhibition Road, which is much larger than his contribution of £80,000 will cover with a decently-constructed building? The situation of that plot is in every respect better than the one he covets. It is adjacent to the East and West Galleries, which are already connected by a cross gallery. These galleries are, in the opinion of the most eminent artists in the country, the best galleries for the exhibition of pictures yet constructed in England, and in them the overflow from Mr. Tate's gallery might in future time find a home.

2. Why should the site which he asks for be cleared of the Physical Laboratory and other portions of the College of Science already housed on it to interpolate an English Luxembourg between two portions of the Science School and Science Museum, relegating the latter to the aforesaid admirable picture galleries, which then for all time can never be annexed to the Tate Gallery, or even put in connection with it? Why, in fact, should the science instruction of the country be sacrificed to this collection of pictures, which is not of sufficient value to be accepted by the National Gallery? We hear a good deal of the French Luxembourg, but would any munificent donor of modern French pictures be allowed to have a slice out of the middle of the École Polytechnique, or of the École Centrale, or of the Conservatoire des Arts et Métiers, if, peradventure, that was the Naboth's vineyard which his heart craved for?

3. Why should the Government or the public suppose that if Mr. Tate's collection of pictures were inserted like a seton into the tissue of the College of Science it would have the effect of drawing a shower of gifts and bequests away from the rival establishment across the Exhibition Road, and only separated from it by a part of the College of Science? That rival establishment contains the Sheepshanks collection, given under stringent conditions to found, and accepted by the Government to found, a National Gallery of British Art. Other collections have been added—even since the Tate Gallery was in the air—on the same conditions. Intrinsically and artistically they are worth probably ten times as much as the Tate collection. From the recent competition which has been held it is evident that the Government propose to spend a large sum of money in completing the South Kensington Museum, which will then be in a position to properly exhibit these and other bequests. It is well known that they cannot be sent to the Tate Gallery. They would be lost to the nation if an attempt were made to do so, the pious donors having taken ample precautions against such tricks being played with their gifts. Whatever pranks the Royal Academy may play with the Chantrey Bequest, there is no reason to suppose that the British Museum or National Gallery pictures can be sent to increase the importance of this new establishment under an irresponsible management, which is not supported by a single artist of eminence, as far as I am aware.

4. Why should Government emulate the antics of the celebrated cow who kicked over the pail of milk she had just filled, and, having done more than any previous Government for technical instruction, make itself superbly ridiculous by dealing an irremediable blow to the advance of that instruction for the sake of Mr. Tate's £80,000? It must be remembered that there is no institution for the advancement of scientific instruction in the country similar to the College of Science with the Science Museum which it is now proposed to dismember for the sake of that £80,000.—I am, Sir, yours obediently,

London, February 9. Y.

NOTES.

THE late Prince Louis Lucien Bonaparte has left to the Nation his valuable collection of metals, which is now in course of arrangement at the Science Museum, South Kensington. The collection is rich in specimens of the rarer metals. This bequest is the result of a promise made to Prof. Roberts-Austen, the Prince having been much interested in the Percy collection at South Kensington. The Prince's early papers, which were mainly chemical, comprised an account of a method of separating cerium from didymium; and he used to refer with pride to his having won admission to the ranks of the Legion of Honour by chemical research.

IN order to afford increased and improved accommodation for the departments of physics and mechanical and electrical engineering, the Council of University College, London, have decided to enter without delay upon a considerable extension of the College buildings. The addition to the College will form an important block opposite the east end of University Street, with an extension for some distance along the Gower Street front of the College grounds. It is to contain separate laboratories and lecture-rooms for mechanical engineering and electrical engineering, with rooms for engineering drawing, a dynamo-room, and all else that is required for an efficient school of modern engineering. This extension will enable the basement and ground-floor of the central wing of the main building, together with a new building to be erected in the inner court, to be devoted to the department of physics, which has hitherto been very imperfectly provided for in rooms that were originally intended for quite other purposes than those to which they have been applied. The position of the new physical laboratory is such that it will be as far removed as is easily possible, in the heart of London, from heavy street traffic.

THE death of the well-known botanical collector, B. Balansa, is recorded in the French journals. He died in the military hospital of Hanoi, Tongking, to which country he went on a second botanical expedition. Balansa was not merely a collector of plants; he was also a botanist, though he never published much, his principal contributions to botanical literature being on the grasses of New Caledonia and of Cochin China. He also published a botanical account of his ascent of Mount Humboldt in New Caledonia. But as a botanical collector, Mr. Balansa contributed to nearly all of the principal herbaria of Europe, having spent many years of his life collecting in Algeria, Morocco, Asia Minor, New Caledonia, Paraguay, Tongking, and other parts of the world. On Sir Joseph Hooker's recommendation he was attached as botanist to the Commission appointed in 1873 by the Paraguayan Government for the scientific exploration of its territory; and he spent three years and a half traversing the country in various directions for this purpose. He made very large botanical collections, but these, as well as his New Caledonian plants, have only been partially worked out. Kew purchased a set of about 2000 species.

ON Saturday last the members of a mountaineering and scientific expedition, under the leadership of Mr. W. M. Conway, sailed by the steamship *Ocampo* for Karachi, whence they will proceed, by way of Abbotabad and Kashmir, to the mountains of Baltistan, on the frontier of Eastern Turkistan. Their object is to explore thoroughly the high glacial area of the Karakoram range. One of their chief aims will be to make a special survey of the great Baltoro glacier, which descends from the peak "K 2" (28,265 feet), the second highest measured peak in the world. They will make scientific collections, and record observations of glacial phenomena. The Baltoro, Punmar, and Biafo glaciers, which unite their streams in the neighbourhood of Askoley, are believed to be the largest glaciers in the world outside of the Arctic and Antarctic regions, and their upper levels have never yet been explored. Mr. Conway is accompanied by the Hon. C. G. Bruce and Mr. J. H. Roundebush; and they are taking with them Mr. A. D. McCormick, the artist of the expedition; Mr. Oscar Eckenstein, a well-known Alpine climber; and Mathias Lurbriggen, of Macugnaga, one of the famous family of Alpine guides. It is understood that they intend to make a determined assault upon "K 2," or one of the loftiest of the neighbouring peaks, with a view to discovering whether the limit to which qualified mountaineers can climb has yet been attained. The expedition, it may be mentioned, has been subsidized both by the Royal Society and by the Royal Geographical Society.

A CRIMEAN Alpine Club has been formed at Odessa. The objects of the members are to explore the mountains of the Crimea, to publish scientific papers on phenomena connected with them, to protect rare species of plants and animals, to favour the development of agriculture, horticulture, and small local industries among the mountaineers, and to provide facilities for tourists, artists, and men of science who may desire to visit the region.

THE 1892 Photographic Conference will be held at the Society of Arts on Tuesday and Wednesday, March 22 and 23, under the presidency of Captain W. de W. Abney, F.R.S.

LAST week we mentioned the case of the miner Johann Latus, of Myslovitz, in Silesia, who had been asleep for over four months. The latest news about him is that he has partly recovered, and the cataleptic rigidity of the limbs, which was characteristic of his somnolent condition, has disappeared. It is curious to note that, although he has conversed with his wife, he seems quite unaware of the long stay he has made in the hospital. No feeling of pain of any sort has been experienced by him, and in fact he cannot recall any sensation during this long period. Dr. Albers, who is attending to him, hopes that he will soon completely recover. Unfortunately Latus has been threatened with inflammation of the lungs, which, view of his present weak state, might be fatal to him. He still continues to take only milk diet, having refused both meat and wine.

DR. G. SCHWEINFURTH has taken up his abode in the Italian colony on the Red Sea for the purpose of completing his investigation of the flora of Yemen and of Northern Abyssinia. He is accompanied by Dr. D. Riva, of Bologna.

PROF. L. H. BAILEY has been appointed special agent of the United States Weather Bureau for the purpose of making a report on phenology, and the relation of climate to the times of blooming, fruiting, and leafing of plants.

MR. WORTHINGTON G. SMITH reports that he has now made water-colour drawings of 492 species of British *Basidiomycetes*, including the whole of the white-spored species of *Agaricus*, for the public gallery in the Botanical Department of the British Museum. The total number of British *Basidiomycetes* is over 2000, and these are intended to be completed on 96 sheets. Closely-allied species are placed side by side, so that the salient points of differentiation can be seen at a glance.

THE fourth number of the Journal of the Leprosy Investigation Committee, just issued, presents much information on leprosy in Russia, Brazil, and Madeira. It contains also papers on the communicability of leprosy by vaccination, and various notes and abstracts. We learn from the Journal that the Report of the Leprosy Commission, together with an appendix containing the results of their laboratory work, is being printed in India, and will probably be ready for issue from the office of the National Leprosy Fund, in London, in a very few weeks.

THE people of Vienna have been greatly alarmed by the outbreak of a new epidemic, which is believed by some to be connected with the influenza. It affects the intestines, its symptoms being fever and acute colic, with the ejection of blood. Its appearance seems to indicate the absorption of some poisonous matter. At first it was attributed to the drinking-water, but this view has been generally abandoned. A representative of a Vienna newspaper has taken the opinion of some of the leading Vienna physicians on the subject. Prof. Nothnagel hesitated to pronounce any judgment on the nature of the illness, the facts not having been sufficiently studied. Prof. Drasche thought it might be "nothing else than a distinct form of influenza," and was confident that it was not due to the drinking-water. Prof. Oser was also sure that the drinking-water had nothing to do with the disease, and "did not consider that there was any indisputable evidence of its connection with influenza." Dr. Bettelheim seemed to think that there was something in common between influenza and the new malady called "catarrh of the intestines." He based his opinion on the fact that from the day when the latter made its appearance in an epidemic form cases of ordinary influenza had begun to decrease. He looked upon them both as being of an infectious nature. A chemical analyst, Dr. Jolles, said it would require three weeks to make a bacteriological inquiry into the character of the illness. A chemical analysis of the drinking-water showed it to be of normal purity.

An appeal on behalf of the Polytechnic (Regent Street) Institute has been issued this week by Lord Reay, Lord Compton, Mr. Mundella, Sir Lyon Playfair, Dr. Gladstone, and other gentlemen, who have lately been appointed on the governing body. They have found the following condition of affairs :—Mr. Quintin Hogg has himself up to the present time paid all the deficiencies of the Institute, besides finding very large sums for constantly building and adding to the premises, amounting to in all about £150,000. Over £23,000 is contributed annually in fees, subscriptions, &c., by those who make use of the Institute, and £3500 is allowed by the City Charities Fund, but there still remains to be met a yearly deficit of £4000. The only way in which the governing body could curtail expense would be to close the Young Women's Institute and the large and numerously attended Art School. They are, of course, extremely reluctant to take this step ; so they ask those who value the work done by the Polytechnic to provide a sum of £4000 per annum for three years. By that time, they trust, aid for technical education may be forthcoming from the London County Council. A donation of £500 for this year's expenses has been promised by Mr. J. Carnegie, and it may be hoped that the governing body will have the satisfaction of being able to meet the difficulty. As they point out, more students are now receiving technical education at the Polytechnic than were being so instructed in the whole of London before the institution was started ; and there is not the slightest exaggeration in the statement that it would be difficult "to over-estimate the benefits which have accrued to the nation at large, and London in particular, from this branch alone of the Polytechnic work."

A company has presented to the Committee of Ways and Means in connection with the World's Fair, Chicago, a proposition which is likely to attract some attention. The company proposes to connect all the large cities of the United States by wires in such a manner that when the President presses the button for the official opening of the Exposition he will not only start in motion the machinery of the World's Fair, but will ring the fire bells and hoist the Stars and Stripes in every town in the country, and also open "the largest mechanical, electrical, and musical concert ever given on earth." According to the American journal *Electricity*, this is all to be done without cost to the Exposition management. Nothing is asked beyond the sanction of the management to the proposed idea, consent to proceed, and the assurance that a similar privilege will be given to no other person or company.

According to a report recently published in Germany, there were, in 1889, 5260 workmen killed in accidents, and 35,392 seriously injured. These losses do not vary much from one year to another. M. Vacher, in *La Nature*, compares the figures with those of the killed and wounded at Gravelotte—one of the most murderous battles in this century—which were 4449 and 20,977. The industries furnishing most accidents are as follows, in descending order : mines, railways, quarries, subterranean works, building, breweries. All industries are arranged in 64 corporations, and it is estimated that more than 4½ millions of workpeople are insured. Wounds and fractures are the most usual form of injury, and the duration of treatment tends to increase every year, by virtue of a law which makes an allowance when incapacity for work exceeds three weeks (this was based on the observation that fractures were generally healed in three weeks). Since this law was introduced, the treatment of fractures has taken longer. There are always more accidents in winter than in summer, and on Mondays and Saturdays than on other days. Also there are twice as many accidents from 9 a.m. to noon, and from 3 to 6 p.m., than from 6 to 9 a.m., and from noon to 3 p.m. Better light in summer, and fatigue towards the end of each half-day of six hours, are supposed to explain some of these variations.

In the February number of *Nature Notes*, Mr. Robert Morley vouches for the accuracy of a story which seems to indicate the possibility of very tender feeling in monkeys. A friend of Mr. Morley's, a native of India, was sitting in his garden, when a loud chattering announced the arrival of a large party of monkeys, who forthwith proceeded to make a meal off his fruits. Fearing the loss of his entire crop, he fetched his fowling-piece, and, to frighten them away, fired it off, as he thought, over the heads of the chattering crew. They all fled away, but he noticed, left behind upon a bough, what looked like one fallen asleep with its head resting upon its arms. As it did not move, he sent a servant up the tree, who found that it was quite dead, having been shot through the heart. He had it fetched down and buried beneath the tree ; and on the morrow he saw, sitting upon the little mound, the mate of the dead monkey. It remained there for several days bewailing its loss.

At the meeting of the French Meteorological Society on Jan. 5, M. Janssen, in his Presidential address, said that meteorology was passing through a critical and interesting period of its history ; it cannot fully render the important services expected of it until it has been sufficiently cultivated for its own sake, without reference to its application to other sciences, such as agriculture, &c. He could not too strongly recommend the more general use of photography for the registration of certain phenomena. Observations in balloons, and on mountain-stations, should be utilized as much as possible, as the latter will have a considerable effect on the progress of the science. He also urged the necessity of constructing self-registering instruments, working automatically for a lengthened period, owing to the difficulty of obtaining continuous records at the highest stations. M. H. Lasne made some remarks on the subject of a communication by M. Teisserenc de Bort at a previous meeting relating to barometric gradients. He thought that the representation of the surface isobars drawn in section in a conveniently chosen vertical plane, is of advantage from a graphical point of view, in order to show approximately the march of the phenomena. On the other hand, he was of opinion that, if calculations were introduced with a view to greater precision, there would be no longer any advantage in making use of the difference of height of the surface isobars.

General Greely, Chief Signal Officer of the United States Army, has just issued a set of international monthly charts of mean barometric pressures and wind directions at about noon (G.M.T.) for 1882 and 1883, for a large part of the northern hemisphere. It will be remembered that this was the period at which special observations were made by the International Polar Expeditions. All the data available for the Polar regions have been used in the preparation of these charts, and they therefore contain more observations made within the Arctic Circle than any previous charts issued by the Signal Office. They show that the general features of barometric pressure in the Arctic regions are a principal minimum in July, followed by a principal maximum in November, with secondaries in January and April (or May) respectively. The author states that he has prepared, and hopes soon to publish, charts of the mean monthly pressures, as determined for the northern hemisphere from the international synchronous observations during ten successive years. He also expresses the hope that some of the meteorologists connected with the International Polar Expeditions will confirm or disprove the theory of a regular march of barometric pressure from month to month throughout the earth, and not simply to and from the oceans and interior of continents, with alternating summer and winter. The unravelling of the complex conditions produced by the march of various types of pressure from one part to another is a necessary prelude of long-time weather predictions for large areas.

The *Mediterranean Naturalist* for January prints some good notes, by Mr. J. J. Walker, R.N., on ants' nest beetles at Gibraltar and Tangier, with especial reference to the Hisperidæ. The search for ants' nest Hister is a somewhat troublesome employment, as only about 2 or 3 per cent. of the ants' nests contain the beetle. Mr. Walker, however, thinks "it is a pretty sight, and one which compensates for a great deal of strain to the eyes, as well as to the back, to see a *Sternocœlis* or *Eretmotus* lying motionless among the hurrying crowd of ants, and then, suddenly developing an amount of leg quite surprising in so small a creature, marching off daintily on the tips of its toes (or rather tarsi) with a ludicrous resemblance, in its gait and appearance, to a tiny crab." The comparatively weak mandibles of the ants are ineffective against the hard armour and tightly packed limbs of the beetles, which devour the helpless brood with impunity. Mr. Walker has more than once taken *S. acutangulus* with a half-eaten larva in its jaws, and they are usually to be found clinging to the masses of larvæ where these lie thickest. On the other hand, he once (but once only) saw an ant take up a *S. arachnoides* in its mandibles and carry it off into a lower gallery of the nest; but this may have been done under the influence of alarm, the frightened ant seizing on the first object that came in its way.

A valuable map is issued with the current number of the Proceedings of the Royal Geographical Society. It has been constructed by Mr. W. J. Turner, in accordance with instructions given by the Hon. George Curzon, who explains in a memorandum various matters connected with the work. The map, with the memorandum and an index to the positions of places, is to be bound in a handy form and published separately.

An interesting paper on the Gran Chaco is contributed by Mr. J. Graham Kerr to the current number of the *Scottish Geographical Magazine*. Mr. Kerr visited the Gran Chaco in connection with the recent Pilcomayo Expedition. Most writers on the region have praised it in unmeasured terms; and this judgment, confined to the zone bordering the fresh-water rivers, is declared by Mr. Kerr to be perfectly just. This zone has the advantages of a beautiful climate, a magnificent deep alluvial soil, good drainage, and facility of access. Splendid forests of most valuable timber alternate with pastures of the richest quality. But the interior, and by far the larger part, of the Gran Chaco is totally different. The usual utter absence of fresh water, and the poorness of the soil and of the pastures, make the country unfit for the agriculturist or the stock-raiser, while timber is comparatively scarce. Mr. Kerr thinks that the Holywood and the *Cascarandá*, as timbers, and the *Üvira* as a textile plant, will probably be found almost the only productions of value in the interior.

The "British Journal Photographic Almanac and Photographer's Daily Companion" for this year, edited by J. Traill Taylor, seems to have increased in bulk, and is as interesting as ever. The articles on the many and various subjects which are dealt with by the contributors are well worth perusal. The tables and the general information given in the volume are all that a photographer requires. The frontispiece, which is a likeness of William II., Emperor of Germany, is from a negative by Messrs. Russell and Sons, and is produced here on bromide paper, as an example of an average print.

Messrs. George Philip and Son have issued a valuable little book on "Technical Education in the Counties," by George J. Michell and Ernest Heber Smith. It is based on a series of articles which appeared last year in the *County Council Times*. The authors have had a large experience in teaching the classes who will be specially affected by the new instruction provided by the Technical Instruction Act. After a general chapter on national education, they deal with special agricultural requirements, night science agricultural schools, the cost of secondary and night science and agricultural schools, higher agricultural schools, and agricultural colleges and universities. Among other subjects discussed are the requirements of mining districts, manufacturing and engineering requirements, and the educational needs of girls.

The Cambridge University Press has issued a "Catalogue of the Type Fossils in the Woodwardian Museum, Cambridge," by Henry Woods, of St. John's College. Prof. T. McKenny Hughes contributes a preface.

Messrs. J. B. Ballière et Fils, Paris, have issued a French translation of ten well-known essays by Prof. Huxley. The volume is entitled "Les Problèmes de la Géologie et de la Paléontologie."

The United States National Museum has published a paper, by Prof. E. D. Cope, on the characters of some Palæozoic fishes.

Charles Lunn's "Philosophy of the Voice" has been translated into German by Herr Ludwig J. Trüg. A special value is given to this translation by various additions which have been made by Mr. Lunn himself.

Two new compounds of carbon, chlorine, and bromine are described by M. Besson in the current number of the *Comptes rendus*. There are three possible chlorobromides of carbon—CCl_3Br, CCl_2Br_2, and $CClBr_3$. The first of these compounds, CCl_3Br, was obtained some time ago by Messrs. Friedel and Silva, by heating bromine and chloroform together in sealed tubes to 170° C. M. Besson now shows that this reaction, when carried further at higher temperatures, yields all three chlorobromides, which may readily be separated by fractional distillation. The mixture of bromine and chloroform, in the proportion of two atoms of the former to each molecule of the latter, is best heated in a sealed tube first for two hours at 225°. The end of the tube is then softened in the blow-pipe flame, in order to permit of the escape of the hydrobromic acid which is evolved during the first stage of the reaction. The tube is then closed, and again heated, this time to 250°, after which it is reopened, and the pressure of gas, which is now mainly hydrochloric acid, released. The tube is finally closed, and heated to 275°, at which temperature the reaction is complete. By proceeding in this manner, the risk of the tube being fractured by the enormous pressure of the evolved hydrobromic and hydrochloric acids is minimized. The explanation of the formation of all three chlorobromides is probably as follows. The bromine first reacts with the chloroform with production of the direct substitution products, CCl_3Br and CCl_2Br_2, according to the equations

$$CHCl_3 + Br_2 = CCl_3Br + HBr,$$
$$CHCl_3 + Br_2 = CCl_2Br_2 + HCl.$$

Subsequently, at a higher temperature, the hydrobromic acid reacts upon the compound CCl_2Br_2, producing $CClBr_3$ and hydrochloric acid,

$$CCl_2Br_2 + HBr = CClBr_3 + HCl.$$

It would doubtless be more profitable to complete the whole reaction at once by heating to 250° if glass tubes were capable of withstanding the pressure, but M. Besson finds that they invariably burst if this is attempted. Upon fractionally distilling the product of the reaction, three fractions are obtained. The first, boiling at 103–105°, consists of CCl_3Br; the second, which distils constantly at 135° and usually solidifies in the receiver, consists of CCl_2Br_2; the third fraction, consisting of $CClBr_3$, boils at 160°, and rapidly solidifies as it condenses. The first chlorobromide, CCl_3Br, is a clear liquid which crystallizes when cooled to −21°. The compound CCl_2Br_2 is a solid at the ordinary temperature, crystallizing in fine needles; it melts, however, to a clear liquid at 22°, and distils without decomposition at 135°. The density of the liquid at 25° is 2·42. It is endowed with an odour recalling that of chloroform, and, like the latter liquid, volatilizes rapidly at ordinary temperatures, its vapour tension at 16° being equal to 21 millimetres of mercury. The third chlorobromide, $CClBr_3$, is readily soluble in ether, from which it crystallizes upon cooling in the form of transparent tabular crystals of specific gravity 2·71 at 15°, and which fuse at 55°. When distilled it suffers a slight amount of decomposition, a little bromine vapour being liberated. Its odour very much resembles that of carbon tetrabromide. It is very soluble in chloroform and carbon tetrachloride, but is much more difficultly soluble in alcohol.

THE additions to the Zoological Society's Gardens during the past week include a Green Monkey (*Cercopithecus callitrichus* ♂) from West Africa, presented by Mr. W. E. Tandy; a Black-eared Marmoset (*Hapale penicillata*) from South-East Brazil, presented by Mr. Harley M. Usill; two Herring Gulls (*Larus argentatus*), British, presented by Mr. T. A. Cotton, F.Z.S.; a Dwarf Chameleon (*Chamæleon pumilus*) from South Africa, presented by Captain J. C. Robinson; a Tabuan Parrakeet (*Pyrrhulopsis tabuan*) from the Fiji Islands, received in exchange; six Dingos (*Canis dingo*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

REPORT OF THE U.S. NAVAL OBSERVATORY.—The Annual Report of the Superintendent of the U.S. Naval Observatory for the year ending June 30, 1891, has just been received. Prof. Hall has been using the 26-inch equatorial for observations of double stars, and his results will soon be reduced and published in a catalogue. The transit circle has been employed by Prof. Eastman in observations of the sun, moon, and planets, and stars necessary for clock and instrument corrections. Prof. Frisby has charge of the 9·6-inch equatorial, and has made a number of observations of comets, asteroids, occultations of stars by the moon, and the transit of Mercury which occurred on May 9, the first and second contacts being successfully observed. The photographs of the transit of Venus in December 1882 have been reduced and discussed, but the whole of the work in connection with the determination of the solar parallax is not yet completed. The solar eclipse of April 15, 1893, occurs under very favourable conditions, and Captain McNair hopes that every advantage will be taken of this circumstance. We note that on two nights a week the 9·6-inch equatorial is set apart for the accommodation of visitors. During the period covered by this Report 2360 persons availed themselves of this privilege.

OBSERVATIONS OF NEBULÆ AND STAR-CLUSTERS.—In 1884, M. Bigourdan began to make micrometric measures of nebulæ observable at Paris, and a portion of his work, containing positions of nebulæ and star-clusters between 15h. and 16h. of right ascension, has recently been published. As an introduction, a brief account is given of the growth of the idea that nebulæ represent an important stage in the development of celestial species; and it is pointed out that measures such as those made at Paris will enable any proper motion to be determined. If successive careful measures should fail to show any proper motion, numerous observations of the motion of nebulæ in the line of sight will furnish data for the determination of the minimum distance of these bodies from the earth. M. Bigourdan next traces the gradual increase in the number of nebulæ recorded, going back to the "Almagest," in which Ptolemy mentions six. Precise observations are said to commence with Messier, and it is estimated that the co-ordinates of about 1500 nebulæ are now accurately known. At Paris the positions of nebulæ have been determined relatively to certain comparison-stars by the method usually adopted for comets; the difference *neb.*−* being found in right ascension by the difference in the times of transit, and in declination by micrometric measures. The instrument employed in the work has an aperture of 0·32 metres, and a focal length of 5·20 metres. The tabulated observations are made up of eighteen columns. First the N.G.C. number is given, and then the name of the discoverer and the date of observation. After this, the magnitude of the nebula is indicated. A nebula, just visible with the instrument employed, is assigned the magnitude 13·5, this number representing the faintest star that it can grasp. The majority of nebulæ observed have magnitudes comprised between 13·2 and 13·5. The state of the sky at the time of observation has, of course, been recorded, and another number is tabulated to indicate the relative ease with which the nebula could be measured. This brief outline of the Catalogue is a sufficient testimony of the care with which M. Bigourdan has done his work, so far as it goes. It is to be hoped that the publication of the completed Catalogue is not very far ahead.

SOLAR OBSERVATIONS.—Prof. Tacchini, in *Comptes rendus* for January 25, gives the following *résumé* of solar observations made at the Royal Observatory of the Roman College during the last quarter of 1891:—

1891.	Number of days of observation.	Relative frequency		Relative magnitude		No. of groups per day.
		of spots.	of days without spots.	of spots.	of faculæ.	
October ...	26 ...	15·54 ...	0·00	54·69 ...	85·77	4·96
November ...	22 ...	12·50 ...	0·00	61·38 ...	51·50	3·41
December ...	18 ...	8·57 ...	0·00	42·18 ...	35·36	2·68

A comparison of these numbers with those for the preceding quarter shows a slight diminution in the phenomena of spots and faculæ. It should, however, be remarked that on no day has the sun been free from spots, and the frequency of groups remains about the same.

The observations of solar prominences are summed up as follows:—

1891.	Number of days of observation.	Mean number.	Mean height.	Mean extension.
			″	°
October	22 ...	9·82 ...	43·6 ...	1·7
November	15 ...	5·73 ...	35·4 ...	1·6
December	21 ...	6·48 ...	40·2 ...	2·2

Prominences were frequently observed in September and also in October, but since this month the number has slightly diminished. The mean number for the quarter covered by this *résumé* is about the same as that of last quarter.

M. Marchand gives the results of solar observations made at Lyon Observatory during the latter half of 1891, in the current *Comptes rendus*. The proportion of spotted surface, expressed in millionths of the sun's visible hemisphere, and the surface covered by faculæ expressed in thousandths of the visible hemisphere, is stated as follows:—

	Spots.	Faculæ.		Spots.	Faculæ.
July ...	1696 ...	38·2	October ...	1180 ...	49·6
August ...	957 ...	40·5	November ...	748 ...	39·2
September ...	2469 ...	51·3	December ...	947 ...	50·0

The total spotted surface is thus 7999 millionths of the visible hemisphere, this being covered by 101 groups. The preceding half year's observations gave 65 groups and a surface of 3517 millionths. Spots have been more numerous in the northern than in the southern hemisphere in the ratio 69 : 32. This predominance of activity in the northern hemisphere also holds good for faculæ. The total surface covered by groups of faculæ is 268·8 thousandths of the visible hemisphere, as against 1363 thousandths in the first six months of last year. The number of groups of faculæ giving these values was 152 (July to December) and 131 (January to June).

MEASURES OF THE NEBULA NEAR MEROPE.—*Astronomische Nachrichten*, No. 3074, contains an account of some measures of the faint nebula discovered by Mr. Barnard close to the bright star Merope, in the Pleiades. The measures were made by Mr. S. W. Burnham with the 36-inch equatorial. The position-angle and distance found by Mr. Burnham are, 166°·3 and 36″·10 (1891·71). These values agree very well with the values 165°·8 and 36″·85 (1890·92) deduced from Mr. Barnard's observations of the differences of R.A. and Decl. between the star and the nebula. This extremely close association of a faint nebula with a bright star is most remarkable; and it will be interesting to determine, by careful measures in the future, whether the patch of nebulosity is drifting through space with Merope and the other members of the Pleiades group.